

# PATENT SPECIFICATION

796,502

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International Classification:—E04f. E05f.

## COMPLETE SPECIFICATION.

### Improvements in or relating to Sliding Doors.

We, GOLMET DOORS, LIMITED (formerly known as Besham Limited), a British Company, of Virginia Park, Caerphilly, Glamorgan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to overhead opening doors suitable for example for garages, sheds, warehouses, and shops.

Overhead opening doors have been known consisting of a single rigid door pivoted on an axis or sliding in two rails. This construction however has various disadvantages. For example, there is a tendency for the door to protrude outside the garage when the door is open, and to reduce the head room in the garage especially when the door is halfway closed. Moreover, these doors leave side gaps providing undesirable inlet of rain, wind and dust. The doors are also somewhat heavy.

According to the present invention an overhead opening door comprises a flexible thin sheet metal door member corrugated transversely and running at its edges in upstanding channels on to overhead supporting means. The door member may move around guide means between the upstanding channels and the overhead supporting means.

We have found that a sheet of metal large enough for a garage door can be moved up and down and around guide means without buckling more or less indefinitely.

The overhead supporting means may be a roller on which the sheet metal member is rolled, or may be a pair of channels in which the edges of the sheet run.

The sheet metal member may be urged by a weight or spring means towards its open position so that it can be opened with a light upward force.

A constructional form of the invention will now be described by way of example with reference to drawings accompanying the Provisional Specification, and a further constructional form will be described with reference to the drawings accompanying the present Specification.

In the drawings of the Provisional Specification:—

Figure 1 is a side elevation of a door member made in accordance with the invention;

Figure 2 is a side elevation of channels and guide to receive the door member of Figure 1;

Figure 3 is a sectional view on the line 3—3 on Figure 2; and

Figure 4 is a sectional view on the line 4—4 on Figure 2.

In the drawings accompanying the present (Complete) Specification:—

Figure 1 is a side elevation of a door member with side channel and support;

Figure 2 is a front view of the parts shown in Figure 1; and

Figure 3 shows a rear view of both channels, door member, and supports.

Referring first to the drawings of the Provisional Specification:—

The sheet metal door member or curtain 10 is made of thin sheet metal e.g. aluminium, aluminium-base alloy, or steel and is either in one single piece large enough to cover the door opening or slightly wider, or may be made of two or more pieces riveted together on one or more horizontal lines as at 11. Thus curtain is formed with angular corrugations 12 transversely across the full width of the curtain and spaced apart by vertical or non-corrugated portions 13. These corrugations may be from one to two inches deep. The curtain also has deeper corrugations 15 at intervals which may be

four to six inches deep and in the same direction as the corrugations 12. Each of the corrugations 15 carries a pair of brackets 16, one at each side, which carries an anti-friction roll 17 pivotally thereon. The top and bottom of the curtain 18, 19 are bent over to carry similarly brackets 20, 21 and anti-friction rolls 22, 23. The bottom edge of the curtain also has an angle bar 25 fixed to it for stiffening and providing a means of lifting the door.

A pair of vertical channels 27 are sunk into the door posts and these are of approximately U-shaped cross-section but have grooves 28, 29 (Figure 4) to receive the anti-friction rolls. The side edges of the curtain are located in these channels. At the upper inside part of the garage are two similar horizontal channels 30 into which the edges of the curtain run. Between the upper ends of the channels 27 and the forward ends of the channels 30 are guide means for guiding the curtain from the vertical channels 27 to the horizontal channels 30 and vice versa.

These guide means comprise, on each side, a curved guide rail 34 and a guide roller 35. The rail 34 has a groove 136 to receive the anti-friction rolls and is mounted on a flanged plate 36 which is fixed on a mounting plate 37 which in turn is fixed to the door frame. The plate 36 has a disc 40 attached to it by rivets 41 and this disc is welded to a tube 42 having a cap 43 at its other end. The tube forms a pivot for the roller 35. The latter has several strengthening ribs 46 and has a plate 47 fixed to it, which plate is provided with an annular rib 48 which bears against the plate 36 as a bearing. The roller 35 has a drum 50 formed integrally therewith and this drum has a cable 51 wound on it, one end of the cable being fixed to the drum and the other end being fixed to the lower part of the curtain e.g. to the brackets 21. The roller 35 is hollow and contains a flat spiral spring (shown in Figure 3 of the drawings accompanying the Provisional Specification) the inner end of which is anchored to the tube 42 and the outer end of which is fixed to the roller.

When the garage curtain or door is closed, the cable winds the roller 35 which winds up the flat spring. The curtain is then in a vertical position. The weight of the curtain is counterbalanced by the flat spring which unwinds and through the cable lifts the curtain (or facilitates lifting of the curtain) into a more or less horizontal overhead position.

The sliding curtain or door can be easily locked by means of a normal cylinder latch, a padlock or other form of lock.

Referring to the modification shown in the drawings accompanying the present Specification:—

The door member 55 is again a sheet metal flexible curtain having transverse

corrugations 56. Mounted on the curtain at each side by inner and outer plates 58, 59 is a pivot pin 60 that carries a roller 61 that runs on a surface 62 of a vertical side channel member 63.

The lower end of the curtain is attached to a plate 65 that extends transversely across the curtain and on this plate is mounted a roller 66 on pin 67 carried by bracket 68 which roller (one each side) provides lateral guiding of the curtain. The plate 65 also carries a latching bolt 70 and a locking bolt 71 and a handle 100.

At the upper end of each channel is a bracket 75 that carries a support 76 for the end of a shaft 77 that is fixed against rotation by a pin 78. Rotatably mounted on this shaft is a series of drums 80 each of which bears against a supporting flange 81 that is pinned to the shaft by pin 86 and has stiffening plates 82, 83 and cover plate 84. A flat spiral spring (not shown) is disposed within the drum and has its inner end pinned to the shaft by pin 87 and its outer end fixed to the drum.

The upper margin of the curtain is clamped to a loop 90 by an angle plate 91 and the closed part of the loop surrounds one leg of a V-shaped bar 93 the other leg of which is held in a loop 94 that is attached to the drum by a screw 95.

When the door member or curtain is pulled down, the springs are tensioned so as to approximately balance the weight of the door member to facilitate its being raised. When it is raised it is wound up around the rollers or drums 80.

The spring or springs (in either example) could be replaced by a weight or weights which are raised when the door member is lowered, or by helical springs which could be fitted to the inside edge of the curtain.

What we claim is:—

1. An overhead opening door comprising a flexible thin sheet metal door member corrugated transversely and running at its edges in upstanding channels on to overhead supporting means.

2. A door as claimed in Claim 1 wherein the corrugations are spaced by non-corrugated portions.

3. A door as claimed in Claim 1 or 2 wherein the door member carries rollers at its sides running in said channels.

4. A door as claimed in any of Claims 1 to 3 wherein the door member when raised runs into a pair of horizontal channels.

5. A door as claimed in any of the preceding claims wherein the door member is connected to a cable which winds up a spring or springs or raises a weight when the door member is pulled down whereby the weight of the door member is counteracted to facilitate its being raised.

6. A door as claimed in any of Claims 130

1 to 4 wherein the upper part of the door member is attached to one or more drums which tensions a spring or springs or raises a weight when the door member is lowered so as to counteract the weight of the door member to facilitate its being raised.

7. A door as claimed in Claim 6 having the spring in the form of a flat spiral located within the drum.

8. A door substantially as described with reference to either of the examples illustrated in the drawings.

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# PROVISIONAL SPECIFICATION.

## Improvements in or relating to Sliding Doors.

We, BESHAM LIMITED, a British Company, of Virginia Park, Caerphilly, Glamorgan, do hereby declare this invention to be described in the following statement:—

This invention relates to overhead sliding doors suitable for example for garages, sheds, warehouses, and shops.

Overhead sliding doors have been known consisting of a single rigid door pivoted on an axis or sliding in two rails. This construction however has various disadvantages. For example, there is a tendency for the door to protrude outside the garage when the door is open, and to reduce the head room in the garage especially when the door is halfway closed. Moreover, these doors leave side gaps providing undesirable inlet of rain, wind and dust. The doors are also somewhat heavy.

According to the present invention an overhead sliding door comprises a flexible thin sheet metal member corrugated transversely and running at its edges in upstanding channels on to overhead supporting means and moving around guide means between the upstanding channels and the overhead supporting means.

We have found that a sheet of metal large enough for a garage door can be moved up and down and around guide means without buckling more or less indefinitely.

The overhead supporting means may be a roller on which the sheet metal member is rolled, or may be a pair of channels in which the edges of the sheet run.

The sheet metal member may be urged by a weight or spring means towards its open position so that it can be opened with a light upward force.

A constructional form of the invention will now be described with reference to the accompanying drawings wherein:—

Figure 1 is a side view of a sliding sheet metal door member made in accordance with the invention;

Figure 2 is a side view of guide means therefor;

Figure 3 is a sectional view on the line 3—3 on Figure 2; and

Figure 4 is a sectional view on the line 4—4 on Figure 2.

The sheet metal door member or curtain 10 is made of thin sheet metal e.g. aluminium, aluminium-base alloy, or steel and is either in one single piece large enough to cover the door opening or slightly wider, or may be made of two or more pieces riveted together on one or more horizontal lines as at 11. This curtain is formed with angular corrugations 12 transversely across the full width of the curtain and spaced apart by vertical or non-corrugated portions 13. These corrugations may be from one to two inches deep. The curtain also has deeper corrugations 15 at intervals which may be four to six inches deep and in the same direction as the corrugations 12. Each of the corrugations 15 carries a pair of brackets 16, one at each side, which carries an anti-friction roll 17 pivotally thereon. The top and bottom of the curtain 18, 19 are bent over to carry similarly brackets 20, 21 and anti-friction rolls 22, 23. The bottom edge of the curtain also has an angle bar 25 fixed to it for stiffening and providing a means of lifting the door.

A pair of vertical channels 27 are sunk into the door posts and these are of approximately U-shaped cross-section but have grooves 28, 29 (Figure 4) to receive the anti-friction rolls. The side edges of the curtain are located in these channels. At the upper inside part of the garage are two similar horizontal channels 30 into which the edges of the curtain run. Between the upper ends of the channels 27 and the forward ends of the channels 30 are guide means for guiding the curtain from the vertical channels 27 to the horizontal channels 30 and vice versa.

These guide means comprise, on each side, a curved guide rail 34 and a guide roller 35. The rail 34 has a groove 136 to receive the anti-friction rolls and is mounted on a flanged plate 36 which is fixed on a mounting plate 37 which in turn is fixed to the door frame. The plate 36 has a disc 40 attached to it by rivets 41 and this disc is welded to a tube 42 having a cap 43 at its

other end. The tube forms a pivot for the roller 35. The latter has several strengthening ribs 46 and has a plate 47 fixed to it which plate is provided with an annular rib 5 48 which bears against the plate 36 as a bearing. The roller 35 has a drum 50 formed integrally therewith and this drum has a cable 51 wound on it, one end of the cable being fixed to the drum and the other end 10 being fixed to the lower part of the curtain e.g. to the brackets 21. The roller 35 is hollow and contains a flat spiral spring, the inner end of which is anchored to the tube 42 and the outer end of which is fixed to 15 the roller.

When the garage curtain or door is closed, the cable winds the roller 35 which winds up the flat spring. The curtain is then in a vertical position. The weight of the curtain 20 is counterbalanced by the flat spring which unwinds and through the cable lifts the curtain (or facilitates lifting of the curtain) into a more or less horizontal overhead position.

The sliding curtain or door can be easily locked by means of a normal cylinder latch, 25 a padlock or other form of lock.

In place of the channels 30 and rollers 35 there may be provided one or more rollers disposed widthwise across the door opening on which the curtain is rolled when opened, 30 one or more springs or weights being provided to facilitate opening. The rollers may be rotatably carried on a shaft and the spring or each of them may be located within the roller and may have its outer end 35 attached to the roller and its inner end attached to the shaft.

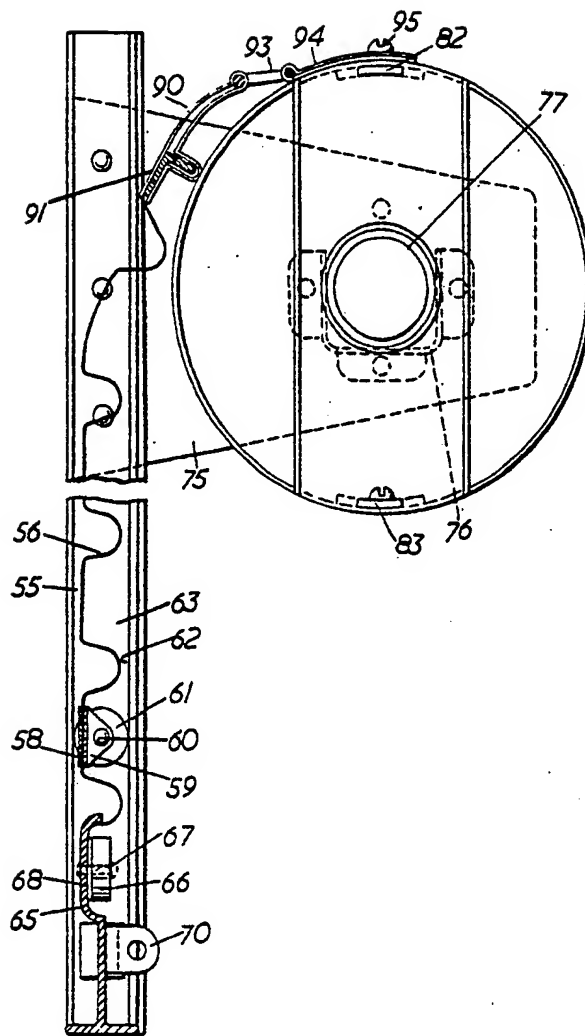
The lower end of the curtain may carry a sliding or other locking bolt.

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FIG. 1.



FIG

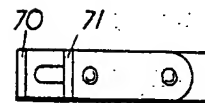
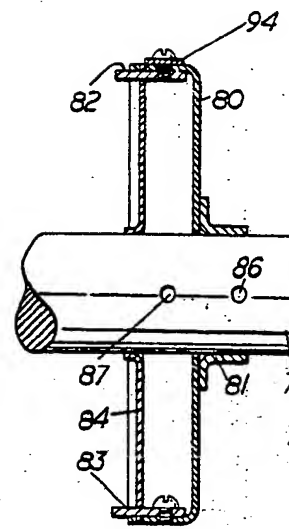


FIG. 2.

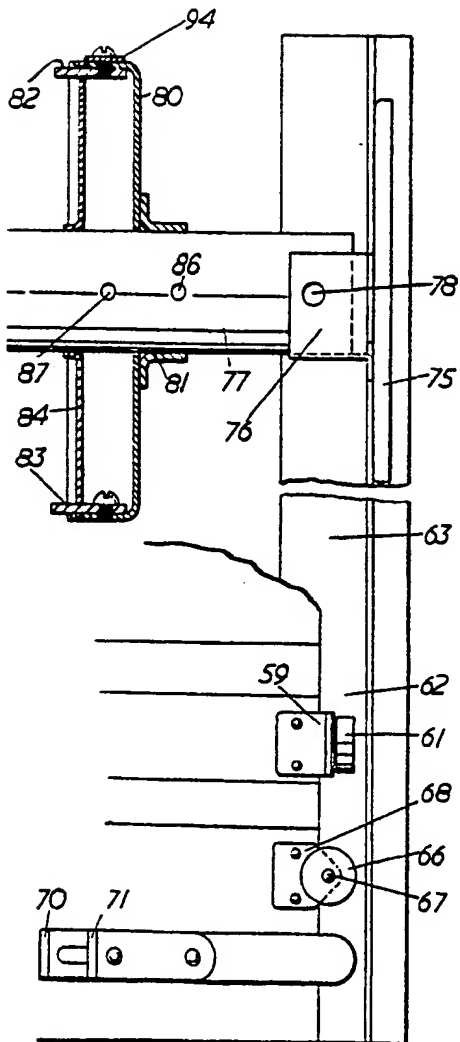
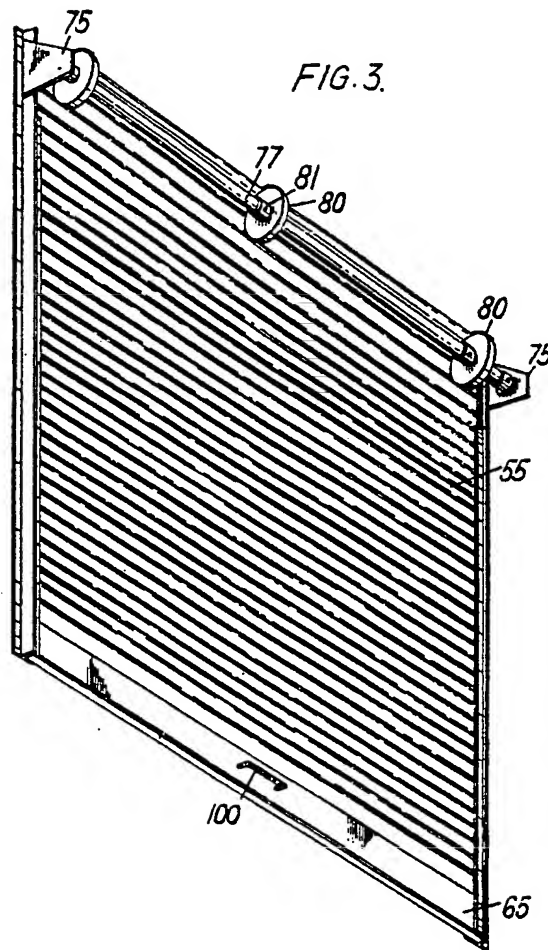


FIG. 3.



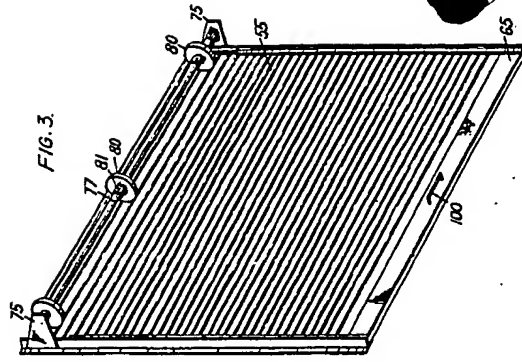
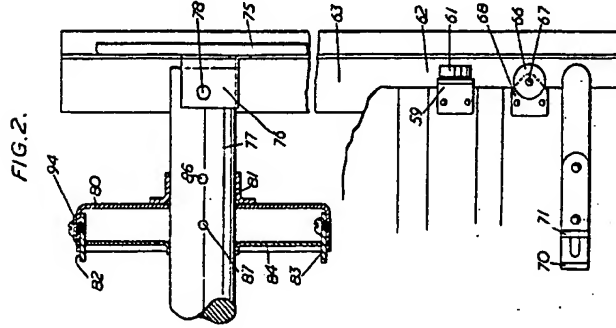
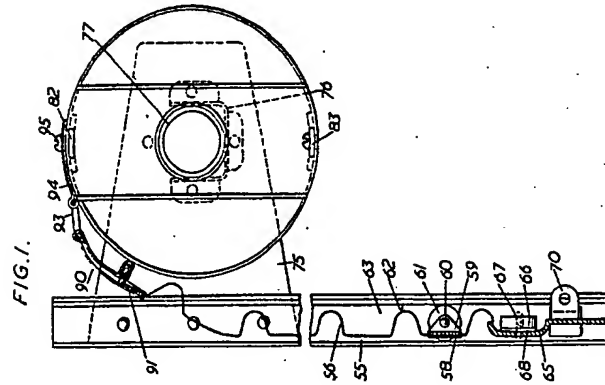


FIG. 1.

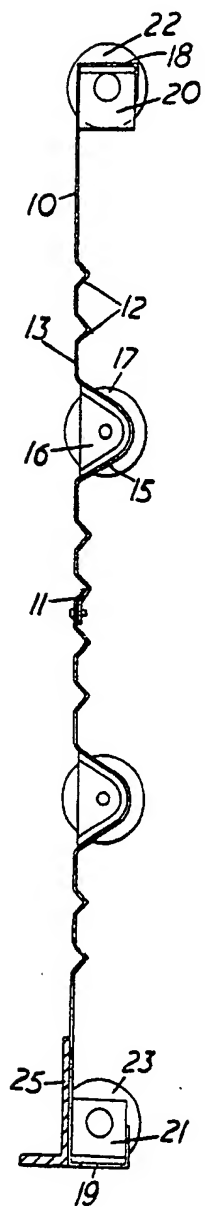
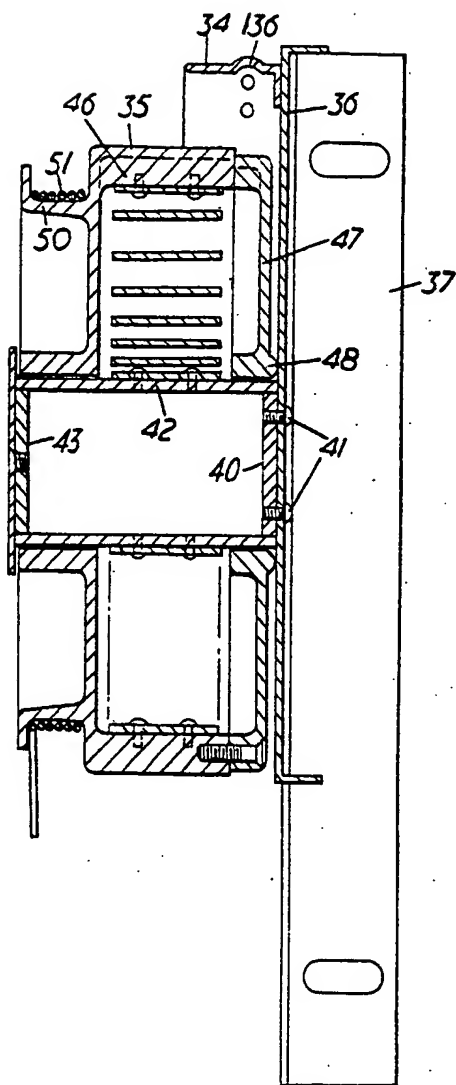


FIG. 3.





796,502 PROVISIONAL SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale.  
SHEETS 1 & 2

FIG. 2.

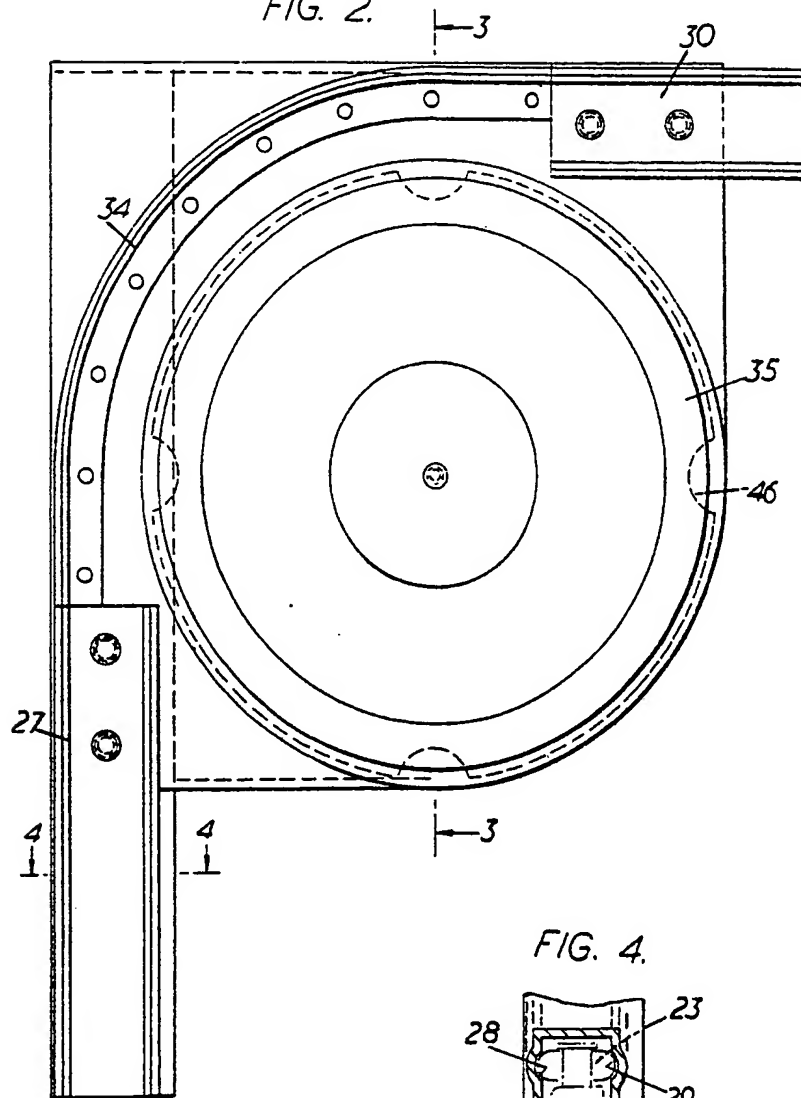


FIG. 4.

